

APPARATUS TO REDUCE BASE DRAG BEHIND BLUFF BODIES

CROSS REFERENCE TO RELATED APPLICATIONS

Applicant claims priority based on the following two provisional patent applications, both using the same title as the present application: 60/210325 filed on June 8, 2000 and 60/275059 filed on March 12, 2001

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH AND DEVELOPMENT

The invention described herein was developed solely by the applicant, with no financial or other assistance from the United States government.

BACKGROUND - - FIELD OF INVENTION

The invention relates to an improved method and apparatus for reducing the fluid dynamic base drag of bluff bodies, including the aerodynamic base drag of large boxy highway vehicles such as trucks, busses, minivans and motor homes.

The highway transportation system in North America is almost totally dependent on fossil fuels, and the quantities consumed are staggering.

Page 2, line 21, cancel "BACKGROUND - - TECHNICAL INFORMATION" and insert - DESCRIPTION OF THE RELATED ART -;

PAGE 2, AS AMENDED, READS AS FOLLOWS:

Long haul semi-trailer trucks alone consume about 16 billion gallons of Diesel fuel per year. In addition to the direct economic costs, the indirect costs include air and water pollution, and depletion of energy resources.

For highway vehicles cruising at typical highway speeds on level roads, aerodynamic drag accounts for the largest engine load, and typically consumes a little over twice the power consumed by rolling resistance. Any significant reduction in aerodynamic drag translates directly into reduced fuel consumption, with the percentage fuel savings typically falling in the vicinity of two thirds of the total aerodynamic drag reduction.

The need for and benefits of reducing the aerodynamic drag of highway vehicles are so obvious, so compelling, and so widely recognized, that this goal often assumes the status of a hidden assumption. It therefore logically follows that all methods, or likely combinations of methods, known to those skilled in the art of aerodynamics of highway vehicles, should already be well researched and the results well documented.

Because large trucks continue to be designed and built with maximum cargo capacity and ease of loading as their primary goals, it is important for any new aerodynamic devices to be designed and built as add-on devices which are easily installed on both new and existing truck bodies, as currently manufactured.

DESCRIPTION OF THE RELATED ART

The basic principles of fluid dynamics and fluid-dynamic drag are presented in many fluid dynamics textbooks and other sources. To this day, one of the best in the field is Sighard Hoerner's classic book, Fluid-Dynamic Drag, self published by the author in 1958. In his book, the basic principles of boundary layers and skin friction drag are presented in Chap. 2, while pressure drag, including base drag, is discussed in Chap. 3. Therefore only the most pertinent technical concepts will be summarized herein.

Page 6, first paragraph, line 1, cancel "BACKGROUND - - PRIOR ART";

PAGE 6, FIRST PARAGRAPH, AS AMENDED, READS AS FOLLOWS:

The need for, and benefits of, reduced aerodynamic base drag are so obvious, so compelling, and so widely recognized, that this goal often assumes the status of a hidden assumption. It therefore logically follows that all methods, or likely combinations of methods, known to people skilled in the art of aerodynamics for highway vehicles, should already be well researched and tested, and the results well documented.

Page 16, first paragraph, line 5, cancel "a";

PAGE 16, FIRST PARAGRAPH, AS AMENDED, READS AS FOLLOWS:

promoting attached flow over the bag". However it does not teach or suggest that the addition of vortex generators can produce significant

additional drag reduction compared to the best configurations used without vortex generators (configuration 27 without vortex generators), or that adding vortex generators would allow using significantly shorter bags.

SPECIFICATION WITH AMENDED CHANGES

Page 1 showing the amended changes

[Utility Patent Application of
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(802) 229-0217
for]

[TITLE:] APPARATUS TO REDUCE BASE DRAG BEHIND BLUFF BODIES

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[BACKGROUND - - STATEMENT OF NEED]

The highway transportation system in North America is almost totally dependent on fossil fuels, and the quantities consumed are staggering.

Page 2, showing changes

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The need for and benefits of reducing the aerodynamic drag of highway vehicles are so obvious, so compelling, and so widely recognized, that this goal often assumes the status of a hidden assumption. It therefore logically follows that all methods, or likely combinations of methods, known to those skilled in the art of aerodynamics of highway vehicles, should already be well researched and the results well documented.

Because large trucks continue to be designed and built with maximum cargo capacity and ease of loading as their primary goals, it is important for any new aerodynamic devices to be designed and built as add-on devices which are easily installed on both new and existing truck bodies, as currently manufactured.

**[BACKGROUND - - TECHNICAL INFORMATION]
DESCRIPTION OF THE RELATED ART**

The basic principles of fluid dynamics and fluid-dynamic drag are presented in many fluid dynamics textbooks and other sources. To this day, one of the best in the field is Sighard Hoerner's classic book, Fluid-Dynamic Drag, self published by the author in 1958. In his book, the basic principles of boundary layers and skin friction drag are presented in Chap. 2, while pressure drag, including base drag, is discussed in Chap. 3. Therefore only the most pertinent technical concepts will be summarized herein.

Page 6, first paragraph, showing changes

[BACKGROUND - - PRIOR ART]